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Edited by WILLIAM HUNTING, F.R.C.V.S.

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GILBEY ON GLANDERS.

Sir Walter Gilbey deservedly holds such a high place among authorities on live stock that any dictum of his gains acceptance. No man is omniscient, and all of us have to take our notions on some subjects about which we know little from men who profess to know something. We rather think Sir Walter Gilbey takes his notions about glanders from some adviser who is shockingly ignorant.

At a recent meeting of the Hunters Improvement Society Sir Walter is reported as saying "There was no encouragement to breed; while the foreign demand was not improved by the unnecessary publicity given to anthrax and glanders. He personally would like to have brought to his notice a single case of the latter disease in this country." We can only hope that the last word but one was wrongly reported, and that Sir Walter really said "*the* country." If our surmise be correct then the speaker was almost literally exact, as the disease prevails only in towns. Not one per cent. of our cases of glanders occurs in the country, and that only as the result of infection carried from town horses.

If Sir Walter Gilbey really said what the reporter has given to the public then he has done great harm by implying that the cases of glanders weekly returned to the Board of Agriculture are non existent—that they are merely the results of errors of diagnosis made by veterinary inspectors, or the morbid figment of veterinary imagination. We have cranks who believe, and try to induce others to believe, that hydrophobia never existed, and that rabies is only an imaginary disease of dogs. We have never yet met a man who denied the existence of glanders among horses.

The Government returns tell us that last week 66 horses were attacked with glanders, and that between January 1st and June 25th of this year no less than 1,387 horses were lost to the Kingdom from this one disease. In the face of these statistics Sir Walter Gilbey is reported to have said before an influential audience that he would like to have brought to his notice "*a single case.*" Now about 80 per cent. of all the cases occur in London, and the Local Authority there takes great pains to be exact. Not only is every case seen by a veterinary inspector during life, but a careful post-mortem examination of every condemned horse is made by two veterinary experts whose experience is probably greater, on this disease, than that of any other two living men.

If Sir Walter Gilbey really made the remark he is credited with he ought to take some steps to correct his idea. As a man of honour he should either substantiate or withdraw a remark reflecting upon the truth of Government returns and the skill and knowledge of the veterinary profession. If Sir Walter really wishes to see a few cases of glanders in London we offer to show him ten or twenty a week provided he will secure the permission of the London County Council.

A few days since a veterinary surgeon offered to stake £100 against a similar sum to be found by Sir Walter on these simple conditions—That Sir Walter Gilbey should be shown ten cases of glanders in London during any week he might select, and that failing to produce the number the V.S. should pay his cheque to the National Veterinary Benevolent Association, or that on Sir Walter being shown the cases he should forfeit his stake to the same institution. Will Sir Walter Gilbey back his opinion by accepting this challenge?

Perhaps Sir Walter only really objected to "unnecessary publicity" given to the prevalence of dangerous preventable diseases. If so, we ask—Does he believe in the policy of hiding them away? Does he suggest that we should let disease alone, and make no effort to suppress it because such a course might "improve the foreign trade in horses"?

These suppositions are absurd—but not more absurd than to deny the prevalence of glanders.

FOOD POISONING—POTATOES?

A ten-year-old London 'bus horse found its way into my district in poor condition; he was purchased by a farmer, taken into work on the land and fed on steamed potatoes, mouldy beans, and cut seeds, which were also mouldy. After rapidly improving in condition this horse was put to work on the land, and continued to give satisfaction in every way until one Monday morning, after being out a couple of hours he was noticed to be sleepy and moved in a very peculiar manner as if he were under the influence of a narcotic. This continued until nearly noon, when the horse collapsed and fell; he was thought to be asleep, and was left until evening to complete his sleep. Having been in this lethargic condition something like seven hours, it was thought time to arouse him, which was accomplished without any difficulty. He got up and went into the stable, where he again collapsed and slept. The following day I was called in to advise what was best to do. Would you doctor him or shoot him? I was asked; but the shooting was deferred.

The animal was moribund, with very feeble pulse, laboured breathing, an occasional moan, extremities quite cold, pin-point contraction of pupils, eyelids swollen, ears pendulous, tongue and buccal membranes purple in colour, the odour from the mouth had better not be described here. There had been no passage of fæces for some hours, neither was there any tympany, but the body was hard. The animal could not swallow.

I attributed these symptoms to potato poisoning, for this reason; six other horses were having the same kind of food *except the potatoes* and were more or less in good working condition. I have seen similar symptoms on other occasions from the indiscriminate use of steamed potatoes, but never from those which have been used uncooked. As this horse could not swallow it was senseless to attempt the ordinary medication, so he had an intravenous injection of Eserine sulph. 2 grs., pilocarpine 1 gr. The action of this was simply wonderful. There were the usual tremblings, etc., with perspiration. The horse seemed to awake with surprise, jumped up on his legs, commenced a circular march, and had in 30 minutes passed a very considerable quantity of slate coloured fæces, a quantity of thick, creamy urine, and in one hour the horse drank a couple of quarts of tepid water. I withheld all kinds of food until the next day and then only gave oatmeal and bran gruel, with the addition of soda sulpho-carb. and soda carb. night and morning.

The third day a more liberal allowance of food, crushed oats, etc., and as the membranes became somewhat yellow I gave a few doses of Mag. sulph. in the water. In a few days the horse was able to resume work on the farm. The pupils remained contracted for 10 days from the commencement of the illness.

F.R.C.V.S.

CARBOLIC ACID POISONING.

Subject.—Aged light cart gelding in fair condition.

History.—Received by mistake, for slight cold, half a pint of carbolic acid (creolin?).

Symptoms half an hour after administration. Staggering gait, usual signs of application of carbolic acid within and about the mouth, but little distress.

Treatment.—Turpentine 2½ ozs., all that was available, in half pint of olive oil. This was given half-an-hour after carbolic. Two hours afterwards I received word that horse walked better and that he had passed dung and urine about which there was nothing remarkable.

The next morning horse was feeding and, except for the local symptoms, appeared to be all right.

It would be interesting to know if others have recently tried turpentine as an antidote. After a recent article in *The Veterinary Record*, to which I owe the information, I should certainly have given a larger dose.

In dogs I have noticed that repeated one minim doses of carbolic acid, useful in some cases of diarrhœa, will produce symptoms of narcotism with no apparent pain.

Recently one of two King Charles' spaniels, after similar treatment of both for skin disease with carbolic, gradually lost use of its hind legs. This during the day passed off much as it came.

Two days after the bath was repeated with similar but more marked results. There was now evident distress and some lung trouble. Recovery, as one would expect, was slower. The one previously unaffected remained so.

W. F. Widden, M.R.C.V.S.

THE BACTERIAL ASPECT OF HYDROTHERAPY.

There is no doubt that a low temperature retards the development of most bacteria, and conversely, that moderate warmth favours their development and multiplication. A good practical illustration is the fact that artificially cooled milk, i.e., lowered to a temperature of 40°F., will keep sweet much longer than if not so treated. In wounds such as open joint, open tendon sheath, compound fracture, etc., where liability to septic infection is great and almost inevitable, it is generally recognised that cold applications are indicated. Hot applications are said to have a drawing effect, and are hence usually avoided. These facts lead to the following conclusions:—

1. In any case of septic inflammation of tissue in a situation capable of being acted upon by hydrotherapy, cold applications act beneficially by inhibiting the multiplication of micro-organisms in the tissues.

2. That the so-called "drawing" action of hot applications was to a great extent due to the multiplication of bacteria under the favourable influence of warmth and consequent increased suppuration and proliferation of tissue.

The action of hot water on tissues where inflammation of a non-septic character exists is highly beneficial, as in tendonitis from sprains, as every practitioner knows, but where septic infection exists any good effect of the moist warmth in promoting resolution is entirely counter-balanced by the fact of it so powerfully favouring bacterial growth and multiplication. Also in septic inflammation of a very superficial character where the hot antiseptic solution can be kept in constant contact with the diseased tissue the effect will be satisfactory. But in all cases where septic infection has penetrated at all deeply by lymphatics, etc., and hence cannot be directly acted on, cold applications are indicated.

WAKEFIELD RAINEY.

THE TEETH AS EVIDENCE OF AGE OF HORSES.

In a recent law case a well known and experienced veterinary surgeon made the following statement in his evidence: "If a horse's mouth is left alone it speaks the truth."

This appears to be the general opinion, and I must confess I thought at one time that horse's teeth were absolutely reliable as an indication of the animal's age up to the period of six years. Why one should expect the growth, development and wear of these organs to be almost infallible I cannot conceive, especially when the conditions which can modify these changes are so many and so varied. Foals are born any time between January 1st and August. The early animal would have an immense advantage over the late one, the former, having enjoyed several months of the best time of the year, gets well formed and nicely developed before the late one puts in an appearance to find the best part of the year gone. When the following spring comes round there is a marked difference between the two. Dams vary in their mothering. The surroundings may be congenial or otherwise, and the food equally variable. Infantile diseases retard growth, and extraction of the temporary incisors hastens the appearance of the permanent. Animals placed under identical conditions may be one or two years late in cutting their permanent incisors, and according to the rapidity or otherwise of the wear, these teeth may be termed hard or soft. The soft full-bodied tooth has usually a much shallower infundibulum than the hard, and the sides wear down much more quickly, (although chemically and microscopically the component parts are as far as I can gather identical, consequently one finds occasionally that these cavities are worn out, or nearly so, in the centres before the corners are in apposition. Again, the hard, or those with bodies flattened from front to back and generally accompanied with a shelly corner, will retain the cavity into the teens.

From my observation I do not consider that we, as veterinary surgeons, are justified, when giving evidence, in stating positively that a horse's age is so-and-so; but rather that the teeth indicate so-and-so.

DAVID PUGH, F.R.C.V.S.

SERUM FAILURE IN TETANUS.

Chestnut Waler gelding, 8 years old. The owner noticed that he was somewhat stiff at work, and that there was a peculiarity about the appearance of the eyes. The next day as this had increased and the stiffness had assumed a woodeness I was called in, and found this condition with a normal temperature, increased pulse, slow respiration.

Treatment.—Injection of 10 cc. antitetanic serum P. D. & Co., isolation, dark box, etc., belladonna electuary. Next day decided improvement; third day not so well, repeated serum, continued electuary all through. Fourth day unable to eat or drink, third dose of serum; rapidly got worse during the day, and being *in extremis* next morning I shot him.

The animal had old standing excoriations on both hind legs, but on the third day of treatment exhibited an irritation of the near eye, which in my own mind I connected with the belladonna electuary and a small ray of light which penetrated the box, this neatly constructed theory was disposed of by post-mortem examination, which revealed a small prickle in the mucous membrane of the lower lid of the eye, and which I believe was the means of entrance of the bacillus.

THE DOCTOR SAHIB.

ABSTRACTS FROM FOREIGN JOURNALS.

A MILK DISEASE.

For three months the milk from the cows in a certain dairy had appeared to be normal when milked but had undergone a change some few hours later, when the cream used to become oily and somewhat gelatinous.

The owner had tried change of food and other expedients without success. The herd consisted of twelve cows of Brittany and Dutch breed in excellent health and condition. The shed, though old, was in good repair, and the milk vessels were kept scrupulously clean.

Debains and Desoubry examined the milk from the morning's milking and found that on putting the finger into the cream that this stuck to it in stringy threads like treacle. If the vessel were shaken the threads adhered to the sides, and on settling there was a viscid scum on them. The skimmed milk remained normal, so that evidently the alteration affected the cream only.

The next day they had certain cows milked separately into different vessels, but the same change took place on standing. So they concluded that the disease was not due to any particular cow or to any insanitary condition of the cows themselves, or to the food, but to the entrance of some micro-organism into the milk from outside.

They took a sample to the laboratory and observed that after 4—5 hours the cream began to be oily and gummy, this continued to increase and reached its maximum in 48 hours. Milk which was sterilized

did not undergo this change, but the addition of a few drops of unsterilized milk set up the condition in a few hours, but slightly more slowly. The same thing occurred if affected cream was added to milk from other sources.

Microscopic examination of the altered cream showed the presence of an aureolate diplococcus that did not take Gram and a long thin bacillus that took Gram. The globules appeared normal.

Although their researches were cut short by the accidental death of their cultures, the authors consider that they had demonstrated the microbic nature of the disease, and this was confirmed by the fact that the condition permanently disappeared after a thorough disinfecting of the premises.—*Rec. de Méd. Vét.*

Dilatation of the Stomach in a Mule.

A mule, 25 years old, which had not shown any previous signs of illness was seized with colic after feeding. Twenty-six hours later Castel found the animal very weak, the mucous membrane pale, pupils dilated, slight abdominal pains, ineffectual efforts at vomiting, extremities cold. Total collapse set in and was followed by death.

Post mortem revealed an enormous general distention of the stomach which had reached a capacity of 50—55 litres, its position, surroundings and microscopical structure were normal, and there had been no previous functional disturbance.—*Rev. Vét.*

F. E. P.

Results of some Experiments with Nodule Disease of the Intestines of Sheep.*

By W. H. Dalrymple, M.R.C.V.S.

In order to give our readers an intelligent conception of the disease with which we have been experimenting, viz., "Nodule-Disease of the Intestines of Sheep," and the object of such experiments; also to preserve the continuity of the work, which has covered several years, we have taken the liberty of reproducing, in part, at least, the article on the subject, and, likewise, the whole of the first part of the work, which appeared in Station Bulletin No. 74, so that the entire subject matter might be given in connected form in this report. It is unnecessary, however, to introduce the disease by entering into a lengthy detailed history of its early occurrence, identification, prevalence, etc. Suffice it to say, that there is hardly a State in the Union that can claim freedom from it among its flocks. For some time it had been mistaken for tuberculosis, the nodules, or tumours, on the intestines resembling, somewhat, the tubercles of consumption; but later investigation revealed the presence of a very minute round worm as the true cause.

The disease gets its name from the nodulated condition of the intestinss, they being, in advanced cases, thickly studded with nodular enlargements all along their course, as far back as the last portion of the bowel (rectum). Everyone who has butchered sheep, in many sections of the country, must be familiar with the appearance, although, perhaps, ignorant of the cause of this condition, known popularly, in some localities, by the term, "knotty-guts."

* A Report presented to the Commission of Agriculture, Louisiana, U.S.A.

In the adult stage, the worm, or parasite (Oesophagostoma Columbianum) is about one-half an inch in length, and may be found located in the intestines, and more particularly, the large bowel. The immature stages or forms, vary in length from 1-100 to 1-6 of an inch depending upon age and stage of development. These are found encysted in the nodules. The writer has dissected quite a number of the larger, older, tumours, without finding the parasite in them, and from which we would infer that they had escaped into the intestine. The life-history of this minute worm, so far as appears to be known, from the more recent investigations, is as follows: The mature female lays her eggs in the intestine. The eggs hatch in a short time, and the embryos, or minute immature worms, pass, in some manner, through the mucous, or internal, lining of the bowel, and become encysted or embedded there; and the irritation produced by the worm seems to give rise to the nodules or tumours, which can be seen, of various sizes, projecting from the intestine, sometimes along its entire course.

Intestines showing Nodule Disease.

The tumour consists of a cheesy material, often greenish in colour, which, on breaking its outer covering, can be squeezed out. It is thought by Dr. Curtice that the embryos are the chief cause of the trouble, and that the adult worms produce but very little, as the latter are comparatively few as compared with the number of tumours. Some of the adult parasites, and probably some of the eggs, pass out from the intestines with the manure, and in this way pastures and other feeding quarters are infected; and in turn, shallow and sluggish watering places into which they drain. There is however, a stage in the life cycle of the worm that seems to be still undetermined. That is, from the time it leaves the bowels with the manure until it is again found in the tumours on the intestines.

The symptoms of nodnlar disease are not very characteristic during life. In fact, there must be thousands of fat sheep slaughtered annually in the abattoirs of the country affected with this ailment, which exhibit no special indications previous to being killed. But in the more advanced stages of the disease, the symptoms resemble those seen in other parasitic troubles, such as general debility and in the most severe cases rapid

emaciation, and excessive diarrhœa. A positive diagnosis can only be made by post-mortem examination and finding the characteristic nodules on the intestines. The cause of death in acute cases is evidently the interference caused by the tumours to the process of absorption. Or, in other words, the animal is deprived of proper nutrition on account of the function of the intestinal walls being interfered with by the tumours, and the process of absorption of nutrient material thereby lessened. The extent of the derangement may be said to be in direct ratio to the number of tumours present.

The treatment so far suggested is chiefly preventive, although we believe the best results would be obtained from a combination of both preventive and curative, when handling an infected flock. The chief drawback to the desired effects of medicinal treatment is the embedded or encysted position of the parasites in the tumours which seem to be beyond the reach of medicines. Still, as adult worms are found free in the bowels, vermifuge medicines would necessarily have some effect upon those in this situation.

Those who are at all familiar with intestinal parasitic diseases are aware that medicinal treatment alone will not yield satisfactory results, but that other measures, outside of the animal, must likewise be adopted. For, to attain our object, we must not only endeavour to destroy the parasites in the animal but we must also treat the infected pastures to destroy or render innocuous the the parasites that may be on their surface, and capable of infecting animals (sheep in this case) grazing over them. A combination of both, then, is necessary for the most satisfactory results. Curtice remarks, "that the same care in changing pastures, in providing good drinking water and a plentiful supply of salt, should be observed in this disease as for other parasites. Judicious fall and winter marketing of infected sheep will also tend to lessen the chances of infection. If pastures are known to be permanently infected, then they should be turned over to other stock for a year or two before being again grazed on by sheep. When it is practical, on the smaller farms, the sheep lots should be plowed, and either planted or left fallow. The object of change of pasture and of plowing is nearly the same ; in the one case to wait until the parasites have died out; in the other, to bury them beneath several inches of soil, from which the sheep owner may rest assured they will not emerge."

Experiments.

In order to make a practical test of the question, for our own satisfaction, as to whether a pasture would become infected after being occupied by sheep affected with nodular disease, and the same pasture afterwards capable of transmitting the disease to healthy lambs, an experiment was commenced at the State Experiment Station on April 10, 1901, by confining three sheep from an infected flock on a small pasture lot, of about one-quarter of an acre in extent, which had not had sheep on it for at least thirteen years.

On Februbry 2, 1902, one of the sheep died, after presenting the usual symptoms of internal verminous disease, such as general debility, emaciation, anæmia, etc., accompanied by loose bowels for two or three weeks previous. An autopsy revealed great numbers of nodules along the course of the intestines.

In order to obtain lambs free from nodular disease to place upon the pasture lot (after the infected sheep had occupied it from April 10, 1901, till about the beginning of May, 1902), several pregnant ewes were purchased by the station and placed in a shed with floor kept clean and sprinkled over with sawdust. Grain was fed to them out of troughs, and green oats, or other soiling crop, out of racks, and they were watered from low-sided tubs or buckets. These ewes were suspected of having nodular disease and which proved to be the case, later, when autopsies were made.

After the lambs were born (between March 25th and April 19th, 1902) the following method was adopted in raising them until they were able to be placed on the lot with the infected sheep: A long shed was used, which was divided off into three compartments, with small gates between each. When separated, the ewes occupied one of the end compartments, and the lambs the other, leaving an empty one between. During the suckling periods, the bars were lowered, and mothers and lambs allowed to come together in the middle compartment. As soon as nursing was over they were again separated into their respective compartments, and in this way were kept from one another, except during the suckling periods, to avoid contamination as much as it was possible.

Four lambs were saved out of half a dozen, two dying from the effects of cotton seed meal, which was an ingredient of a grain mixture fed when they were thought to be old enough to eat a little concentrated food.

On May 3rd and 5th a lamb, with its mother, was placed on the infected lot.

On July 24th the first lamb died. Post mortem revealed a number of small nodules on the large intestine. and a tape-worm (tænia expansa) in the small bowel.

On August 22nd the second lamb died. and a number of small nodules were found on the large bowel; a tape-worm in the small bowel; and great numbers of twisted stomach worms in the fourth compartment of the stomach.

The autopsy on the first lamb that died was made by one of the college students during the temporary absence of the writer on State Farmers' Institutes, and stomach worms were not examined for. But it is our opinion that these worms were the cause of death in each case. Still, that did not vitiate the results of the test so far as nodular infection was concerned.

It should be stated that, although we commenced with only three infected sheep, we had as many as eight infected animals on the small lot during the time the two lambs were on it.

As a control experiment, the other two lambs, which were born and raised under similar conditions to the first two mentioned, were kept in a large clean box stall, were fed a little grain and green stuff (after they were weaned), and were afterwards staked out during the day on different parts of the horticultural garden, close by, but away from any opportunity of obtaining nodular infection. These two lambs remained in a healthy condition and continued to thrive, weighing, together, 108 1-2 pounds, gross, when they were butchered on November 1st, 1902.

On post-mortem examination their intestines were absolutely free from nodules.

So far as this experiment goes, it simply substantiates the general opinion held by helminthologists, with respect to the entozoa (internal animal parasites), viz., that infection is spread to pastures through the medium of animals infested with parasites, and that previously sound animals may obtain the infection, afterwards, through grazing upon such pastures.

A knowledge of the fact, then, that a pasture may become infected through the medium of diseased sheep occupying it, and that sound lambs may obtain the infection by grazing upon it, either in company with infected sheep, or within a reasonable length of time after the latter have been removed, is of the utmost importance to our sheep-owners. But they should also be familiar with the more intelligent methods for the elimination of the infective agent (the parasite) from the pasture.

As may be inferred from the foregoing, a great many, probably the majority, of intestinal worms spend only a

portion of their life-history in the body of the host on which they are parasitic, the other part being spent outside on the ground, or sometimes even in the body of some intermediate host, as is found to be so with tape-worms, fluke-worms, etc.

In the case of the minute round worm (nematode) which produces the nodules on the intestines of sheep, it would appear that at least some of the worms, or their eggs, escape with the bowel discharges on to the surface of the ground, and from there are taken up by other animals causing, in sound ones, infestation and, in the case of those previously diseased, re-infestation.

The inference to be deduced from this cursory glance at the life-history of intestinal parasites, such as the one under consideration, therefore, is that in addition to the administration of remedies directed to the destruction, or expulsion, of worms from the host in which they attain maturity, some treatment should be afforded the pasture that has become infected, and harbours the parasite in one or more of its stages. And if this part of the treatment should be overlooked or neglected, the successful eradication of this or other similar ailments of sheep cannot reasonably be expected.

It was with the view of freeing the pasture of parasitic infection that the following experiment was undertaken, the details of which we now proceed to give.

The pasture-lot in which the experiments were conducted as before stated, is about one-quarter of an acre in extent, and fenced in with wire netting to protect its occupants from the possible ravages of dogs running at large. At the conclusion of the first experiment, this lot, which was then in an infected condition, was, on October 25th, 1902, ploughed up ; considerable care being exercised during the operation to have the surface turned under as effectually as possible, and, close up to the fence bottom, where it was difficult, or impossible, for the plough to reach, a spade was used to complete the work over the entire area. The object aimed at in doing this was to bury the infection (worms, their eggs, or immature forms) beneath the sod so inverted.

On November 1st, 1902, this lot was sown to oats, from which an excellent crop was cut for hay on April 26th, 1903.

In order to again obtain a few sound lambs, that is, free from nodule disease of the intestines, to place upon the lot after the pasturage (Bermuda grass) had attained sufficient growth to afford them sustenance, three grade-ewes were procured from a farmer in a neighbouring parish on April 3, 1903. One of the ewes came with a one-day-old lamb, the other two being within a short time of lambing. The flock from which these sheep were obtained had been affected with nodule disease for several years, at least, to the writer's personal knowledge. Similar preparations were made for the reception and care of this lot of ewes and lambs as for the bunch mentioned in the last experiment, viz., a shed divided into three compartments, connected by small openings with a gate on each. The two end compartments were occupied, respectively, by the ewes and the lambs, so as to keep them separate, except during the period of nursing, when they were brought together in the centre compartment (the floor of which was covered with sawdust and kept free from droppings all the time), and immediately separated again when suckling was over. The purpose here was to avoid, as in the previous case, contamination of the lambs through contact with the excrements from their mothers, or material they might eat, that should, perchance, have become soiled by parasites extruded with the manure.

On April 15th the second lamb was born ; and on the 18th the third. Two of the lambs were grade-Dorsets ; the other a grade-Southdown.

Besides the mother's milk, to which they had access thrice daily, it not being convenient to permit of their suckling oftener, they were allowed a little green feed and a small quantity of crushed grain in their compartment, both of which they soon learned to eat and to relish.

On April 26th the mother of the Southdown-grade lamb died from tetanus (lockjaw), the result of infection of a large wound produced by a projecting nail when the animal was rushing hurriedly through one of the gateways. So that the two remaining ewes had to take their share in supplying the orphan lamb with milk, and which they managed to do without any apparent difficulty.

On June 18th the three lambs were turned out on the pasture lot, during the day only, sufficient growth having developed for them to graze on, and they were nursed in the morning, previous to turning out, and in the evening after being housed. This arrangement continued for a few days, when, on June 26th, the ewes went dry, and the lambs were allowed to remain in the lot from this time on, a small quantity of crushed grain and fresh water, given them daily, and they had a small but suitable temporary shed provided for protection against both rain and the excessive heat of the summer sun.

It will be noted that the lamb last born was just two months old when turned out ; the others being two months and three days, and two and one-half months respectively.

The lambs grazed regularly over the pasture lot, getting the little grain daily, as mentioned, to supply some of the nourishment (protein) for growth, of which they were deprived when the mother's milk was cut off, and were occasionally given a few sweet potato vines, of which they seemed passionately fond. They remained in perfect health, with no evidences whatever of parasitism, and on January 9th, 1904, after being on pasture for a period of six months, 22 days (June 18, 1903, to Jan. 9, 1904), they were slaughtered and dressed by a local butcher, who purchased them. A careful post-mortem examination was made of the intestines of each lamb, but with negative results. That is, not the sign of a nodule could be found.

Some authorities have suggested the possibility, or even probability, of lambs obtaining infection from the mother's udder (bag) when nursing, the parasite being attached to some part of that organ. We do not doubt the possibility for this mode of transmission, when the ewes and lambs occupy pastures that are infected, the bag and teats of the mother coming in contact with the egg or worm infected ground. But although all of the ewes from which we secured our experiment lambs were severely affected with nodule disease, none of the lambs, or at all events neither the two "controls" in the first part of the work, nor the three in the last part could have been infected in this way, as proved by perfectly "clean" intestines when the autopsies were made. It may be, however, that the conditions under which the ewes were kept with us precluded the possibility of infection in this way. Yet no special attention was paid to the absolute cleanness of the ewes compartment, and which was at times sufficiently foul with droppings to favour contamination of their bags and teats when resting on the ground. Such, however, evidently did not occur in our case.

The conclusions deducible from the results of the experiments may be stated as follows :

(1). That sheep suffering from nodular disease of the intestines, when placed upon a hitherts clean pasture, transmit infection to it through extrusion of the nodule-worm (œsophagostoma columbianum) from their bowels probably with their droppings.

(2). That when sound lambs are permitted to occupy a pasture so infected they will contract nodule disease.

(3). That when the surface of an infected pasture is turned under by ploughing, and the land cropped, even for a single season, the infection may be destroyed.

(4). That when sound lambs are allowed to occupy and graze upon a pasture (previously infected) after being cultivated and cropped, as above mentioned, they will remain free from nodule disease.

(5). That lambs, the progeny of ewes affected with nodule disease of the intestines, can be raised free from this disease, provided proper methods are adopted to prevent contamination, and,

(6). That if an infected pasture is placed in cultivation for a time to destroy the parasites on it, clean lambs raised, as suggested by the method adopted by us, or purchased and known to be clean, and all affected sheep disposed of for slaughter (this ailment being confined to the intestines mainly, and not rendering the flesh unsafe as an article of human food), the disease may eventually be eradicated from both the land and the flock.

Owing to the fact that probably the majority of sheep butchered in different parts of the State seem to show nodules on their intestines, it would appear that our old sheep pasture lands or ranges are very generally infected with the parasites of this disease, and so long as the sheep remain on these feeding grounds so long will the disease exist, by the animals becoming infected, and in turn reinfecting the land and themselves. When the time comes, however, for such lands to be placed in cultivation, and take their part in a regular system of crop rotation, we will then have little difficulty in predicting the material reduction, if not the extermination of this, as well as other internal parasitic diseases of the sheep. But even under existing conditions it is questionable whether it would not be more profitable to abandon the keeping of large flocks of diseased and scrubby animals on the old infected ranges and have fewer but better and more valuable ones of the improved breeds on the farm—rather than on the range—where their feeding grounds could be periodically changed, which is inimical to the development of worms, and the sheep cared for and handled in an intelligent manner for the profit that may be obtained from them. Sheep husbandry is a profitable branch of agricultural industry, when conducted in a business-like way. But when sheep are neglected there is no variety of domestic animal that will degenerate more rapidly, or succumb to the ravages of parasitic invasion more readily, with failure and loss as the inevitable result. Consequently whoever hopes to succeed in the sheep growing business must become educated to its conditions and requirements, as has to be done by those engaged in, and who make a success of, other branches of industry.

THE CENTRAL VETERINARY MEDICAL SOCIETY.

An ordinary general meeting was held at 10 Red Lion Square, Holborn, W.C., on Thursday, June 2nd, 1904. Mr. R. Porch, president, in the chair. There were present Messrs. A. L. Butters, J. Rowe, P. S. Howard, C. H. Sheather, C. Sheather, R. J. Foreman, W. Perryman, E. E. Martin, L. Savournin, A. E. Gostling, P. W. D. Smith, J. A. Nunn, J. S. Hurndall, C. W. W. Brown, W. Pritchard, G. Sutton, T. S. Green, and E. Lionel Stroud, hon. sec.

The minutes of the last meeting were taken as read, and signed by the Chairman.

The SECRETARY read a letter from Mr. Henry Simpson, of Windsor, expressing his regret at being unable to attend the meeting.

MORBID SPECIMENS.

The CHAIRMAN produced two specimens which he thought would be of some interest. The first was a case of chronic lameness, commonly known as sesamoiditis, involving the fetlock joint. The mare was fired, but still remained lame; kept for six months she continued lame, and he performed neurotomy of the posterior tibial. After that the animal worked for about two months, but owing to going suddenly very lame, eventually had to be slaughtered. It was found that one of the sesamoid bones was fractured into three pieces. He could not call to mind that he had ever seen such a case before. There had been some ossific deposit round about the bones, but from the animal in life he imagined that there was a considerable ossific deposit, which the post-mortem did not reveal.

The other specimen—he called it a fracture, he did not know whether it was or not—but it was a diseased condition of the os corona. This mare appeared to have a cracked heel, a sort of latent cracked heel that would do neither one thing nor the other. Poultices had no effect, and after a plaster there was still lameness. After being in the slings ten days or a fortnight there was a bulging round the coronet which fluctuated with pressure, and which he thought contained pus. He explored it as deeply as he dared without entering the joint, and he was unable to obtain any pus or serum. The mare was slaughtered, as the lameness continued very excessive, and the post-mortem revealed this. On the upper articular surface of the os corona a loose piece of bone, and that was resting in a hole which they would see had some considerable depth. It was practically in the same condition before bulging as now. The articular surface appeared to be quite healthy, and the under part seemed as though it had been fractured out and continually worked about. The disease process of the bone continued for some considerable time, evidently leaving a large hole. It was the first case he had seen of being fractured in that way, and he thought he would bring it to the inspection of the Fellows of the Society.

Mr. FOREMAN, referring to the specimen brought by the Chairman, asked if the animal was unnerved at all. He had a very similar case, but in the os pedis, of one that had been tinkered with for about four months by a blacksmith. The blacksmith asked the speaker what could be done with it. It was bulging round the coronet, but there was no discharge. He divided the posterior tibial, and it went practically sound straight away. It had not touched the floor for about two months with that foot. But after the wound healed the horse began gnawing the front of his foot above the coronet, and so he (the speaker) told the blacksmith to have it knocked down. It was a very similar thing—the floating piece of bone on top of the os pedis. He thought it was a very common thing for them to begin gnawing the foot when they had a bone like that in the joint loose.

Col. J. A. NUNN, A.V.D., D.S.O., asked the President with reference to that pastern bone if he examined its fellow after death. The reason he did so was that the condition of it looked to him as very much resembling a condition that had been a good deal written about in foreign literature lately, and designated as "the ostitis of fatigue." In this one author had given a considerable number of statistics, and had weighed the two corresponding bones, and had found that the diseased bone was considerably lighter than its fellow. He attributed various pathological states to this cause, and amongst others what he called "the neurosis of fatigue." The condition that Mr. Porch drew attention to of the articular cartilage being intact on the loose piece of bone was not unknown, and if he recollected aright it was mentioned in a very old work by Baron de Poitrines, who gave a case of it as occurring in the human knee joint.

The CHAIRMAN replied that he had not examined the opposite bone, he took the leg as being lame and troubled no further.

Capt. MARTIN said that it appeared to him that the commencement of the disease was a rarefying ostitis of the bone, and it became localised just in that part. Probably the articular surface was the last to be affected, and before it became affected the bone gave way from the pressure above, the bone over the inflamed part. It was a very curious and interesting specimen, and he was very pleased to have seen it.

Mr. HOWARD asked what the condition of the horse was in its general health, and the amount of flesh it carried.

The CHAIRMAN: It was in good condition, it wasted away with the pain considerably, but it maintained its condition very well considering everything. It was very fat when it was noticed first. It was like an ordinary cracked heel that healed up, and there was no wound of any kind after.

Capt. MARTIN: You found no matter there?

The CHAIRMAN: A sort of bloody serum enfiltrated in the several parts. There was no pus, none whatever.

Mr. SAVOURNIN produced a living specimen, being a pug bitch, which he described as one of those little animals that had been fallow by nature, so to speak. It was a curious thing, and he thought it might be interesting to the members to see it.

The HON. SEC. (Mr. E. LIONEL STROUD) referred to the specimen brought by Mr. Savournin as unique, and he was very much obliged to him for bringing it before the Society.

ELECTION OF FELLOW.

Mr. W. R. DAVIS, M.R.C.V.S., of Enfield, was unanimously elected a Fellow of the Society.

THE RELATIONSHIP OF THE ANGLES OF ARTICULATION IN THEIR MECHANICAL ASPECT IN THE HORSE.

By Col. J. A. NUNN, A.V.D. D.S.O.

Gentlemen,—We all flatter ourselves we know what the good and bad points of a horse are, and I need not enter into a description of them beyond saying that they are all governed by the common laws of machinery, which apply not only to machines but the particular branch that interests us, viz., animal mechanics. All animals are machines, and the ultimate factor of motion is the lever; examples of all three orders being represented in the body. In order to get the greatest value out of a lever, the position of the force acting on it, or the power; the weight to be moved and the fulcrum should be understood, and in animal mechanics this depended on the position of the bones or levers in relationship to each other. As you can readily understand, the position of the levers alters the angle they make with each other, as for instance the angle formed by the scapula and humerus will be larger in a straight than a sloping shoulder.

These angles are termed "articular angles," and not only are they governed by the fixed laws of mechanics, but all through the body certain angles are in relationship with others and should coincide with them, if not there is lack of reciprocity in the parts of the machine which in quadrupeds we must look on as two separate ones working in harmony with each other, or if you will excuse what rather savors of an Irish Bull "the quadruped is a double biped" and it is a few remarks on these angles that I shall offer for your discussion tonight.

The articular angles are:—

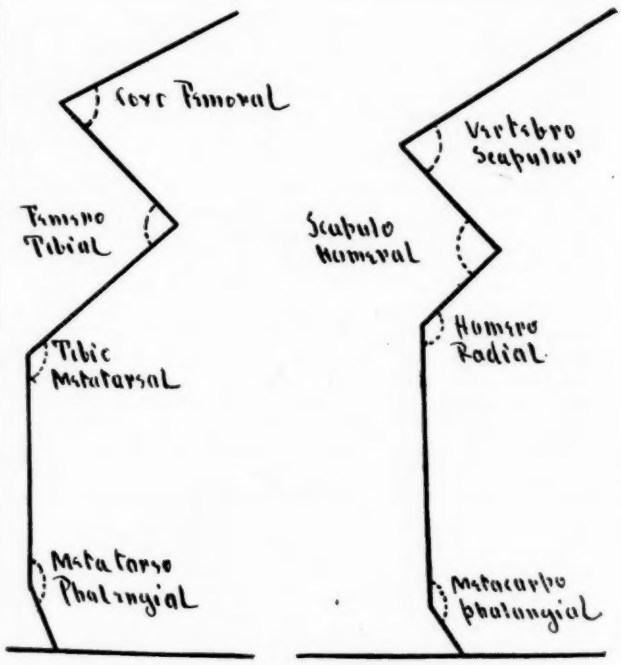
In the fore limbs: The scapulo humeral or shoulder, humero radial or elbow, metacarpo phalangial or fetlock.

In the hind limb: The coxo femoral or croup, femero tibial or stifle, tibio metatarsal or hock, metatarso phalangeal or fetlock.

In this enumeration there is one more angle in the hind than the fore limb, but this is more apparent than real. The pelvis is immobile, and forms a portion of the trunk in addition to one side of the first articular angle of the hind limb, and corresponds with the vertebro-scapular formed by the anterior portion of the spine and scapula; so logically the articular angles in both limbs correspond in number.

The following table sets forth the relationship of the angles in the hind and fore limbs:

1.	*Ant.* Vertebro scapular angle of the body	anterior opening	
	Post. Coxo femoral, croup	upper side fixed lower side moveable	
2.	*Ant.* Scapulo humeral, shoulder	Posterior opening	
	Post. Femero tibial, stifle	both sides oblique and moveable.	
3.	*Ant.* Humero-radial, elbow	anterior opening	
	Post. Tibio metatarsal, hock	both sides moveable upper side oblique lower side vertical	
4.	*Ant.* Metacarpo phalangial, fetlock	anterior opening	
	Post. Metatarso phalangial fetlock	both sides movable upper side vertical lower side oblique	



FUNCTION OF THE ANGLES.

The articular angles act by the movement of their arms, coming together during flexion, when the size of the angle is decreased, and separating on extension when it is increased, the angle being closed or opened.

The limb is raised and moved forward to take a step, and during this period, "the period of suspension," the principal angles are closed. When the foot is in contact with the ground, "the period of support," the angles are opened from the the separation of their arms, as the long bones forming them oscillate from behind forward round the pivot formed by the foot on the ground, bringing with them the upper part of the limb and the body, a movement of *impulsion*.

The opening and closing of the articular angles are essential in the act of locomotion, and if hindered movement will be hampered, as is illustrated by the case of a stiff or anchylosed joint. All the angles do not participate in the "movement of impulsion" in the same degree. Neumann (Des aplombs chez le cheval,

Journal de Médecine Vétérinaire Militaire, vol. viii., 1869) shows that the most active are those where openings are anterior, that is the vertebro scapula, humero radial, and metacarpo phalangial in the fore, the coxo femoral, tibio metatarsal, and metatarso phalangial in the hind limb, and that the scapulo humeral and tibio femoral whose openings are directed posteriorly are only what he terms "complementary angles."

The angles of impulsion are those that have to be studied, and they can be considered as superior, viz., vertebro scapular and coxo femoral, and inferior, viz., humero radial, metacarpo phalangial, tibio metatarsal and metacarpo phalangial.

Conformity of the Angles.

The degree of variation in the angles as can be readily understood must be identical in the corresponding limb. If it is not it will give rise to irregularity in movement, of which we get an illustration not only in cases of partial anchylosis, but in many lamenesses. Furthermore the movements of the angles of the hind and fore limbs must be in corresponding ratio to each other, although not necessarily of exactly the same degree. The hind limb being behind the centre of gravity is capable of producing a larger degree of "movement of impulsion" than the fore, whose chief function is to be placed in advance and receive and sustain the weight of the body on the new base of support at each step, and therefore it is necesary that the degree of oscillation of the fore and hind limbs should be identical, as the latter are almost entirely used for propulsion.

Everything being equal this will take place if the corresponding angles, whose openings are in the same direction, are of corresponding size. The result can be easily imagined in the case of an animal in which the angles of the fore limbs are small and the hind large. The latter having a greater mechanical capacity are capable of exercising a greater impulsive effort than the former are able to utilize, and the result is want of concordance or reciprocity between the fore and hind quarters. Conformity of the corresponding articular angles comes under the following two rules: 1st, That the direction of these angles should be identical: 2nd, that if there is any variation it should be identical in both, following the law on mechanism. If the articular angles for any special reasons vary from the normal, this variation must be general in order to maintain the mechanical equilibrium of the motor.

Variation of the Articular Angles.

The size of the angles varies according to the use that the animal machine is put to, and is one of the chief characteristics of its class, varying in the horse in light breeds and draught animals. In horses used for quick work one of the chief points in speed is the extent "or length of the arc" over which the limbs will oscillate, which depends on the length of the various segments or the long bones and the size of the angles formed by them. Two limbs being of equal length the one in which the angles of impulsion are largest will oscillate over the longest arc of a circle. It therefore stands to reason that in light horses the chief point from a mechanical point of view is that the angles of impulsion should be wide, and to allow of this the arms are not so oblique as in the heavy horse, and the limbs proportionately longer. The race horse has an arm and thigh but little from the perpendicular, and a long fetlock so that the angles of the elbow, hock, and fetlock may be wide.

An exception to this rule must be made with the superior angles of impulsion the vertebro scapular and coxo femoral which are small, the first from the obliquity of the scapula, and the second from the pelvis, as from this shape greater mechanical force can be obtained by the muscles of the shoulder and hip. The complimentary angles are of sufficient width to allow of the free action of the arms, the scapulo humeral and femoro tibial by the straightness of the humerus and tibia. The race-horse, therefore, with an oblique shoulder and a sloping quarter has long limbs with small superior and large inferior angles of impulsion, which facilitate rapidly with a proportionately considerable length, and a compensating diminution in breadth; the body being narrow from side to side so as to give the oval shape on section termed by Baron "Sterno-thorax."

Two points are to be considered in the draught horse, the size of the muscles and their relative position to the lever or arm of the articular angle on which they act, and on the size of these angles the degree of force that can be exerted depends. The wider the angles are the nearer the arms approach the vertical, and consequently the muscles are nearer being in a parallel line to them. On the contrary the narrower the angles are the further the muscles are from the parallel and the greater the force they are able to exert on the arm of the lever. The draught horse therefore has a sloping fore arm and thigh, with short pasterns, and the angles of the elbow and hock small, although from the sloping portion of the pelvis the coxo femoral angle is often larger than it otherwise need be.

The sloping portion of the humerus would make the complimentary angle of the shoulder small, but this is compensated by the scapula being near the perpendicular, so that not only is the vertebro scapular angle enlarged, but there is a better seat formed for the collar.

To sum the matter up, in the draught horse the superior angles are wide, the inferior narrow, and the limbs short, the body is near the ground and short. The shortness of the body on the horizontal line is compensated by width, the chest on section shewing the form Baron designates Eurythorax.

Relative Size of the Angles.

The late General Morris, of the French Army, endeavoured to prove that all the oblique bones of the limbs should form an angle of 45° with the horizon, so that the angle formed by two oblique bones should be a right angle, and that by an oblique and vertical one 135°; but as pointed out by Newmann (Des aplombs ches le cheval, *Journal de Méd. Vét. Mil.*, vol. viii., page 352) this is incorrect, for in the first place very few of the diagonal bones form an angle of 45°, and in the second that there is not a right angle in the body.

M.M. Goubaux and Barrier some years ago made a number of measurements of the angles of horses' limbs and marked out the mean by an instrument invented by them for the purpose. It consists of a piece of wood with a brass semi-wide at the upper end marked off in 180 degrees, in the centre of which a second piece of wood is pivoted. It is furnished with a plumb line so that it may be held perpendicular. They determine what they term the centre of movement of the bones forming the angles which are (1) scapulo-humeral conversely of the trochanter; (2) humero radial, the insertion of external lateral ligament into the radius; (3) coxo femoral, the lower part of the concavity of the trochanter; (4) femero tibial, the upper head of the lateral ligament; (5) tibio metatarso, centre of the astragalus; (6) metatarso phalangial, the same as the metacarpo phalangial. These points give the axis of movement of the arms of the angles. The centre of the moveable arm of the instrument is placed over the centre of movement the long arm being held perpendicular, the short arm moved round till parallel to the bone and the angle read off on the brass sector. The measurements Goubaux and Barrier took were exceedingly elaborate, and are given in detail in their work, *Exteriuur du*

Cheval, from them they have formulated tables as to what the average size of the articular angles of the horse are.

Scapulo humeral 115°, humero-radial 140 to 145°, metacarpo phalangial 150°, coxo femoral 110 to 115°, femero tibial 145 to 150°, tibio tarsal 155 to 160°, metatarso phalangial 155°

Goubaux and Barrier have shown that the angle with the ground of the corresponding arms of the angles in the fore and hind limbs is greater in the former than the latter, and the angles of the hind limbs are longer than the corresponding angles of the fore. If we exclude the coxo femoral we will find that the same total of the remaining three, viz., scapulo humoral, humero radial, and metacarpo phalangian in the fore limb is 405°, and the femoro tibial, tibio tarsal, and metatarso phalangial in the hind 455°. The reason why the angles in the hind limb are larger than the fore can be explained by the fact that they are the propellers, and their degree of oscillation is interfered with by the resistence offered by the centre of gravity of the body, which is greater than has to be overcome by the fore ones, which are in front of it, and in this manner the difference in the size of the angles of the fore limb is compensated, and they work in harmony.

The authorities I have compiled these notes from are :

Professor Neumann, *Journal de Médecine Vétérinaire Militaire*, vol. 8, 1869, p. 352, an article entitled "Des Aplombs chez le Cheval."

General Vallon, *Cours d'hippologie*, Saumur, 1865.

Daudet, *Traité, de la locomotion de cheval relatif a l'equitation*, Saumur, 1864.

Alexis Lemoigne, *Giornale della pazze degli animali utili e di Medicina Veternaria*, Naples, 1865.

Goubaux and Barrier, *Extérieur du Cheval*.

Jacoulet and Chomel, *Traité d hippologie*.

Marey, *Le Machine Animale*, 1873.

Montane, *L'Extérieur du Cheval*, 1903.

And these authors I beg to acknowledge. The subject of animal mechanics is an abstruse one, and has on the Continent and in America attracted much attention, the subject of this paper being only a very small section on which, gentlemen, your remarks will be valuable. I must thank you for the way you have listened to me, and apologise for not bringing a more interesting subject before you, but I was asked by your Secretary at somewhat short notice to fill a gap, and took this subject from a remark made to me by an acquaintance in the hunting field last winter as to why animal mechanics received so little attention in England, a country in which almost the greatest insult you can offer a man is to doubt his capacity as a judge of the points of the horse.

Discussion.

The Chairman said they had heard this paper which Col. Nunn had been kind enough to bring forward, and although he had apologised, he (the speaker) was sure it was of great interest to all veterinary surgeons, and no doubt the lecturer would be very pleased to explain any point they were in doubt about. They would also be pleased to hear the opinions of any gentleman on the subject.

In reply to a question from the Chairman as to whether the diagrams represented the angles of the two limbs.

Col. Nunn said they were not drawn to scale. They were taken from Messrs. Goubaux and Barrier's book. They were intended to represent the angles of the bones, etc. The one diagram was only intended to show what was meant by the vertebro scapular and the scapulo humeral angle when the leg was standing naturally on the ground, what they called the "position of support."

Mr. Sheather asked to be allowed to point out to Col. Nunn that the opening angles of the hind limbs seemed to be smaller than those of the fore limbs. He (the speaker) thought that Col. Nunn made it a point that the opening angles were larger and so showing a greater propulsive effort.

Col. Nunn replied that the drawings were not made to scale, the angles were marked but not measured. He had not time to draw them to scale.

Prof. Pritchard asked if Col. Nunn represented that the difference of the angles—he took that from the subject of the paper—had anything to do with the introduction of disease or lameness.

Col. Nunn could only give his own opinion about it. He was afraid to answer that question. The original authors of the subject had to be asked. It was a matter he had never considered.

Prof. Pritchard said they knew if they were examining horses as to soundness they took into consideration the angles that his friend had pointed out, and they had to consider whether that horse was likely to become lame or not on account of the formation of his limbs. If the horse had a straight shoulder they came to the conclusion that he was not a riding horse, but was more fitted for harness. If he had straight pasterns they came to the same conclusion, but he was at a loss to make out from his friend Col. Nunn why they should come to the conclusion that the disease arose from certain angles unless they had proof beyond that. If a horse was brought to him lame in both fore limbs he should take into consideration his age at once. If he were an old horse he should form a certain opinion about him. If he were a young horse, and his shoulder were in a proper position, he should come to another conclusion. He did not think the angles came in there. With regard to the hind limbs there were certain angles they took notice of and liked, and certain angles they took notice of and did not like. He did not think they could lay down any fast and firm law with regard to the angles of the hind limbs. They knew the difference between the sickle hock and the hock with genuflection. There the angle came in, but he did not think they could form their opinion solely on any angle, nor could they come to any conclusion about the malady on an angle.

Col. Nunn replied that all these authors from whom he had taken his information had discussed this point not at all from the aspect of causing disease. They had all discussed these angles from the point of the utility of the horse, chiefly for speed. They none of them discussed it from say a pathological or surgical point of view.

Mr. Sheather said he could not conceive any more useless study than the study of the angles in relation to their position. They had seen some of the most beautiful horses absolutely without courage. They had not the slightest capacity for exerting their muscles to the proper extent. They saw animals with every rule of formation set at nought doing wonders. It had been so from the earliest times, and would be to the end. He considered there was no more unsatisfactory study than Barrier's book. At the end of it he was worse off in his knowledge than before. He would rather trust to his knowledge gathered year by year than to knowledge gained from that book. It was personal experience that was needed. They wanted a whole day to go through the details of the formation of a horse. The moment he moves they saw a defect, and an animal that appeared to be all fire and life had no power of sustaining its pace at all. He really thought that although a great deal of credit was due to Col. Nunn for taking so unsatisfactory a subject from many points of view, it showed a deal of courage in taking a subject so dry. He was to be congratulated upon it, but at the same time he (the speaker) felt that if one was to attack the subject of horse formation in this piecemeal manner no good would come of it. It was beyond anyone's capability to

judge of horses if they began to dissect in detail. If they had not a natural gift of judging quickly from formation, and movement, and quality, what an animal was, they would never do it by going through this painful, laborious process.

The CHAIRMAN asked Col. Nunn's opinion as to racehorses with straight hock and long pastern—whether that was a personal opinion that it was necessary to have a horse with a straight hock and a long pastern to obtain speed. He had never observed in judging horses that those with the straight hock and long pastern had a turn of speed. He agreed with Mr. Sheather that the man who could judge angles was the man who had the aptitude to judge a horse. No doubt as Mr. Sheather said, it was the horse's courage that made him go. In a way it was rather departing from Col. Nunn's paper, as he had stated that he was giving this as the result of reading the works of some continental gentlemen who had simply tried to prove these angles as being what they should have. But he would like Col. Nunn's opinion on the straight hock and the long pastern. It was one of the worst forms of weakness they could have in formation, if they wished to obtain any amount of work from a horse. Whether this was prejudice on his part he did not know.

Captain MARTIN thought there was a good deal in what Mr. Sheather had said, but on the other hand there was a good deal in the fact that a study of these angles of the horse's limbs could not help proving useful. There would be none of them who had done much riding but who knew the difference in the pleasure of riding a horse with a sloping shoulder, and also he might say with a long pastern, but he quite agreed with the Chairman when he said that the long pastern was liable to be a source of weakness. There was no doubt about it, however, that it often did lend to speed, but it meant there was a great strain on the back sinews, and there again they had the fact that the long pastern is a long lever, and the longer the lever the greater the strain there was on the parts that moved it. Long pasterns were a source of weakness inasmuch as horses were very liable to break down, *i.e.* their back tendons or ligaments go with the strain of the weight there is on them. In the same way he thought straight hocks, although they admit of great flexion and extension, and conduced to speed, were rather a source of weakness inasmuch as they put too much of a strain on the parts that move them. This was a thing they all had to see, but it could not help being a profitable study, this question of the angles of the horse's limbs.

Mr. SAVOURNIN did not know whether they looked upon it that there was a hard and fast rule as the result of the enquiries with regard to angles. Mr. Porch had incidentally referred to one point with regard to the angle of the hock in racehorses. He did not know whether the majority of the Fellows would agree with him, but personally he should prefer to see a horse with a fairly acute angle in the hock, but he knew as a matter of fact that trainers rather preferred to see a horse with very little angle at the hock—what they would call a straight leg behind—whether that was really the fact that it conduced to speed he was not prepared to say. He would rather take his chance and have a horse with an angle at the hock, which certainly looks more graceful, sooner than a straight legged horse. His object in rising was really to ask Col. Nunn whether these gentlemen who had gone so closely into the subject—which Mr. Sheather described he thought very properly as a very trying one—had formed the opinion that there was a hard and fast rule as to angles.

Mr. SHEATHER said he was going upon the same basis that these gentlemen arrived at as to angles which should exist in an animal which should give speed and capability above the average. Every gentleman who had spoken since had given evidence quite to the contrary, that the best of animals had sometimes the worst of formations. That was why he described the study as unprofitable. It was a matter of courage and other things as well.

Mr. BUTTERS thanked Col. Nunn for bringing this subject before the Society, but he thought, as Mr. Sheather described it, he had brought it rather piecemeal. There could be no doubt as to the advantages of the study of animal mechanics, but the study could not be complete unless they took into consideration compensations. As Mr. Sheather had pointed out, an animal might have certain angles which were not quite what they ought to be, but he had other advantages of muscle and formation which compensated and gave the necessary turn of speed or strength of movement in a heavy weight. The study was not complete by merely drawing up a set of forms for certain proportions of angles. A matter of this sort really required to be improved by a study of the other parts of the animal's body, including perhaps a well developed nervous system. He thanked Colonel Nunn for his paper.

Col. NUNN, in reply, said he had answered some of the questions already, and some of the other members had rather torn them to pieces for propounding strange notions, but they were not his opinions; they were all the opinions of these authors he had quoted. Mr. Porch asked about a straight hock and a long pastern, which one of these gentlemen, he thought it was Capt. Martin, said was necessary for speed, and asked his opinion. Well he was altogether of Mr. Porch's opinion, quite in contradiction to the author he had quoted. For the purpose that he would buy a horse he should prefer him to have an angle in the hock, not a straight one; and perhaps the answer would answer the question Mr. Porch had asked. But Mr. Savournin also asked if these authors propounded a hard and fast rule. They had not. They had looked on the thing entirely in the light of a mechanical machine, and as Mr. Sheather said—there were some animals that were absolutely perfect to look at that were no good, and others imperfect, having some compensating power. They could allow that. In fact one of the authors, he thought M. Lemoigne, put the animal as a machine, and likened them to a steam engine. He put one, as it might be, as the most perfectly adapted machine, but without any boiler to make steam in; the other an imperfect one but with a boiler to make steam in, and that would beat the perfect one. Mr. Butters had suggested that this was rather a piecemeal paper, and that the other portions of the body should have been touched on in the same way. He was afraid he had bored them enough with this already, and that if he had gone into the other part he might have bored them still more. One of the works he had consulted contained about 700 pages and another was in two volumes each of 500 pages. Mr. Sheather had expressed the opinion that the study of animal mechanics was no use. He did not quite agree with him, as he had found it of some use.

Mr. SHEATHER: I think you misunderstood me. For such a study as this it is no use; it is too minute a portion.

Col. NUNN said perhaps so. He quite agreed. He did not think he had found it of *very* much use. He had paid it a good deal of attention at odd times, and had attempted to work out these theories, and he must say as a rule he had failed. Like Mr. Sheather he had owned a great number of horses in his time. He had owned one or two to his sorrow that were perfect to look at, and when he took them out to make them go they were absolutely useless. He had owned others—what they call "five cornered brutes"—and they had given him a good deal of fun in hunting, and he had killed pigs and played polo on them. The study of animal

mechanics was not one that had been pushed in England; but he had brought the thing forward rather to get their opinion on the whole matter. Col. Nunn concluded by thanking the members for the way in which they had received his paper.

On the motion of Professor Pritchard, seconded by Mr. Sheather a cordial vote of thanks was passed to Col. Nunn for reading the paper.

The meeting terminated with a vote of thanks to the gentlemen who had produced the morbid specimens, and to the Chairman.

R.C.V.S. Prosecution at Bradninch.

William Rawle, described as a farrier, of Bradninch, was summoned for acting as a veterinary surgeon without a certificate.

Mr. J. Beal, Exeter, appeared to prosecute on behalf of the Royal College of Veterinary Surgeons. Mr W. T. Watkins, of Tiverton, defended, and pleaded not guilty.

In outlining the case, Mr. Beal said that in January of this year, within six months of the date of the present proceedings, defendant represented himself to be a veterinary surgeon, and in more than one way. A brass plate was placed in the window where defendant lived, and he attended horses and cattle, and received payment for so doing. In one case three bottles of medicine were purchased by a farmer, and on a receipt defendant signed himself as "Wm. Rawle, veterinary surgeon." At the death of Mr. Miller, who had been in practice as a veterinary surgeon at Bradninch, it occurred to defendant that it would be a capital thing for him to set up practice there. He received a note sent to the Castle Hotel for the Bradninch veterinary surgeon, and called on the person who sent the note, and attended to a mare. Mr. Beal contended that there was no defence whatever. Veterinary surgeons had to undergo strict examinations, incur large expense to qualify, and it was only right that the profession should be properly protected.

P.C. Hunt said that defendant had been residing at the house of Mr. Rutley, Bradninch, and during the time he had been there he had exhibited a brass plate, with the words, "Wm. Rawle, veterinary surgeon."

Wm. Sprague, farmer, Colebrook Farm, Cullompton, said that he paid defendant 4s. 6d. on March 10th for three bottles of medicine, and a receipt was given him, signed "Wm. Rawle, veterinary surgeon."

Cross-examined by Mr. Watkins, witness said that he let Mr. Wintle, veterinary surgeon, Cullompton, have two of the medicine bottles, but he did not say what he wanted them for. He denied purchasing the medicine for the specific purpose of trapping Rawle.

Edward Jasper Nicholls, farmer, Washbeer Hayes, said that on January 26th he sent a note to Bradninch summoning the services of a veterinary surgeon. Defendant answered the call, and his treatment of a mare was incorrect. Defendant, however, had never sent him any bill for his services, and he (witness) had paid nothing.

Wm. Rutley said defendant lived at his house, and a brass plate was exhibited in the window.

Cross-examined by Mr. Watkins, witness said that the plate which was an old one, bore the words "Wm. Rawle, veterinary surgeon." A Mr. Short had told him that the business was the defendant's father's. It was known in the neighbourhood that he was not a qualified surgeon.

For the defence, Mr. Watkins said that the name of defendant's father, Wm. Rawle, was on the Register in 1881, and he (Mr. Watkins) was instructed that at the present time he was an existing practitioner, and that defendant, whose proper name was Wm. Llewellyn Rawle, was acting as his father's assistant at Bradninch, which he considered he was perfectly justified in doing. There was professional jealousy in all circles. He ventured to assert that Mr. Wintle and Mr. Sprague had a conversation before the bottles of medicine were purchased, and that the bottles having got into the hands of Mr. Wintle, they were handed over to the prosecution. It was a frivolous, trumpery case, and nothing less than trapping.

Defendant said he was 27 years of age, and his father lived at Thorverton, and that his father authorised him to act as his assistant at Bradninch and Cullompton.

Mr. Watkins was about to submit a letter received from defendant's father, in which he said matters were so explained; but Mr. Beal objected to it being put in.

A fine of £10 and costs was imposed.—*Devon and Exeter Gazette.*

DISEASES OF ANIMALS ACTS 1894 TO 1903.

SUMMARY OF RETURNS, WEEK ENDING JUNE 25, 1904.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Rabies. Cases Confirmed.		Swine Fever.	
	Out-breaks	Animals.	Out-breaks	Animals.	Out-breaks	Animals.	Dogs.	Other	Out-breaks.	Slaughtered *
Week ended June 25, 1904	13	14	..	..	44	66	..	..	46	168
Corresponding week in 1903 ..	13	20	..	..	28	57	..	..	39	235
Corresponding week in 1902 ..	7	13	..	..	25	39	..	..	32	114
Corresponding week in 1901 .	10	10	..	..	28	42	..	..	104	508
Total for 26 weeks, 1904	530	821	..	..	769	1387	..	..	798	3863
Corresponding period in 1903 ..	429	669	..	..	683	1135	..	..	879	4191
Corresponding period in 1902 ..	377	625	1	120	563	1032	12	2	868	4098
Corresponding period in 1901 ..	356	504	12	669	649	1122	1	1	2115	10231

NOTE.—The figures for the Current Year are approximate only.
Board of Agriculture and Fisheries, June 28th, 1904.

* As Diseased or Exposed to Infection.

ORIGIN OF PARASITISM IN FUNGI.

Mr. George Massee, a Principal Assistant in the Herbarium of the Royal Botanic Gardens, Kew, has contributed to the Philosophical Transactions of the Royal Society of London an interesting account of investigations that he has carried out on the origin of parasitism in fungi. The research also throws much light on the factors that determine the immunity of certain species of plants and even individuals to the attack of specific fungi. It is well known that certain parasitic fungi have the power of attacking with ease definite crops, whereas they have no power to enter the tissues of other crops, even though they be closely related. It has also been found that even varieties of some particular species of plant may be resistant to the inroads of a parasite, while other varieties may at once succumb. For example, some wheats are much more resistant to rust than others, while during the past few years varieties of turnip have been raised which have special power of resistance to the attack of the parasite that causes "finger and toe." This immunity or comparative immunity has attracted the attention of many scientific workers, and now Mr. Massee claims to have discovered its cause. Formerly it was held that an individual plant was liable to invasion by a fungus, or not, according to the condition of the atmosphere at any particular time, or owing to the special development of the cuticle covering the leaves or stem. Should the latter be specially strong, then it was believed that the fungus might find it impossible to enter; on the other hand, if the cuticle was specially thin, the fungus would have little difficulty in effecting an entrance. Mr. Massee's researches, however, go to show that small differences in character of the sap of the plant are probably the main determining causes as to whether the fungus shall be able to gain an entrance. As a general rule it was found that if a weak solution of sugar was introduced beneath the skin of the leaf, and if the spores of our commoner parasitic fungi were distributed on the patch so treated, the fungus had the power of entering and living on the sugary solution, and eventually of attacking adjoining tissues. If, on the other hand, a weak solution of acids was introduced the fungus as a rule showed no disposition to enter., Certain fungi are purely saprophytic, that is to say, can only live on dead vegetable matter; and yet by gradually accustoming them to push their tubes into living plants by injecting a substance by which the fungus is attracted Mr. Massee has been able to "educate" such fungi into becoming parasites, that is to say, fungi capable of attacking living plants. He comes to the conclusion that all parasites have developed from saprophytes, and that it is quite possible for a harmless fungus living on dead vegetable matter to acquire the habit of living on growing plants. As a case in point he cites the fungus *Dendryphium comosum*, which, until recently, appears to have been quite unable to attack living plants, but which, aided by the unnatural conditions under which certain glass-house crops are now grown, has been found to attack in a serious manner young cucumbers.

Although the subject of inducing saphrophytes to become parasites is one that has but little interest for the practical farmer or gardener, the case is different where the problem is attacked by the botanist from the other side. Reference has already been made to the result of "educating" turnips and wheat to resist certain diseases, and we also know that certain varieties of potato are much more resistant to the attack of the parasite that produces potato disease than others; in fact, immunity to disease is a matter constantly in the minds of the raisers of new kinds of potatoes.—*The Journal of the Board of Agriculture.*

ALLEGED CRUELTY.

At the Petty Sessions held at the King's House, Lyndhurst, on Wednesday in last week, Edward Gooding, a farmer, of Marchwood, was summoned for cruelty to two horses by working them while in an unfit state.

The evidence given then was very unsatisfactory, Inspector Slattery deposing that both animals were excessively lame, suffering from great pain, in poor condition, and quite unfit for any kind of work.

Mr. G. F. Gould, M.R.C.V.S., went further, and said that he saw the horses, and the small one was suffering from a sprained condition of the flexor tendons, of long-standing ringbone, a contracted foot, and fetlock joint partly overshot. A bay gelding was lame on both forelegs, due to the inflamed condition of the flexor tendons, and the off fore had ringbone. Both animals were quite unfit for work. The bay was aged, in poor condition, and unfit for any work through the lameness.

For the defence Mr. John Tarver Burden, M.R.C.V.S., of Beaulieu, said that on May 16th he saw the two horses. The bay—the smallest—was in good condition, free from any sores, but in the near fore limb it had had strained tendons of two years' standing, which caused it to limp. The horse was about fourteen years old, and fit to do ploughing work on the land. It was free from sidebone or ringbone. The other horse—a bay-brown gelding—was in good condition. It went slightly tender on both fore feet; no sidebones or ringbones. He was commonly called a "groggy horse," but fit to work on land.

George Henry Browning, a farmer, of Marchwood, also said he had seen the horses worked on several occasions, and both worked well, walking between three and four miles an hour. If they were suffering from any pain they could not do that. It was only light work they had to do, and were not worked more than four and a half hours per day at the most. The cob was a little stiff on the near fore leg, but he could not see anything the matter with the other horse.

Colonel W. Martin Powell, who was then in the chair, dwelt on the unsatisfactory nature of the evidence, saying that someone was making a mistake, and he expressed a wish to see the horses, so that he might be able to judge for himself as to their condition.

The case was accordingly adjourned until Monday, the defendant promising to bring the horses there for the inspection of the Bench.

The horses, according to promise, were brought down for inspection on Monday before the Court sat, and were seen on the green outside the Workhouse at Lyndhurst Road by Lieut-Colonel W. Martin Powell, Mr. H. F. Compton, and Colonel Heathcote, magistrates, who examined the animals, and afterwards the Court was held in the Master's Office at the Workhouse.

Addressing the defendant, Colonel Powell (who was in the chair) said the Bench had taken a great deal of pains about these horses, and they had decided to convict him with regard to the smaller horse, as they considered it unfit to be used at all. The other horse was fit to be used on ploughed land. Defendant would be fined 5s. and the costs, 13s., which he paid.

Defendant asked if he might ask a question of Mr. Slattery?

The Clerk to the Magistrates (Mr. W. Coxwell): The case is closed.

Colonel Powell (addressing Mr. Slattery) said neither of the horses had ringbone.

Mr. Slattery: They are deeply seated on the coronet.

Colonel Powell said he could detect nothing of the sort, and there were no sidebones. There was no evidence whatever of ringbone. It was a great shame such evidence should be given. It ought not to be. Then it

was said that the big horse had sprained flexor tendons, but it was nothing of the sort.

Mr. Slattery: But it was a month ago.

Colonel Powell: I don't care about a month ago. If a horse had flexor tendons, as you say in this case, they would not disappear in a month.

Mr. Slattery: But you had the professional evidence.

Colonel Powell: I don't care about that. I claim to know as much about horses as any man in England. At least I ought to. I served in Her Majesty's Army, in a cavalry regiment, for a great many years, and I ought to know what ringbones are. I ought to be ashamed of myself if I do not.—*The Southampton Times and Hampshire Express.*

PARLIAMENTARY.

Slaughtered Horses.

In the House of Commons, Tuesday June 21.

Mr. Cremer (Shoreditch, Haggerston) asked the Secretary to the Board of Trade whether he had any information or statistics in regard to the number of slaughtered horses, or horses unfit for work, that are periodically exported to the Continent; to what country or ports they are consigned; whether he could state what becomes of the exported animals; whether he had any information to the effect that the flesh of these animals was made into condiments of various kinds, returned to this country, and sold as articles of food.

Mr. Gerald Balfour (Leeds, Central): I have no information as to the export of slaughtered horses. The horses exported alive during the five months of this year at a value of under £5 each have numbered 1,665, and all of them have been shipped to Holland, Belgium, or Germany. I have no official information as to what becomes of these animals after they are landed on foreign soil.

Mr. Cremer: Has the right hon. gentleman any information to the effect that these carcases go to feed Protectionist countries? (A laugh).

Mr. Gerald Balfour: I have no information that any carcases are exported, but if the hon. gentleman will provide me with any information in his posession I shall be glad to look into it.

Parliamentary Committees.

Tuberculosis (Animals) Compensation Bill.

The Select Committee of the House of Commons appointed to consider this Bill met on Tuesday, June 21. Mr. Grant Lawson occupied the chair at the opening of the proceedings, and afterwards Sir M. Stewart presided.

Mr. William Coggan, ex-president of the National Meat Traders Federation, and member of the Council of the Smithfield Club, gave evidence to show that there were frequent complaints in the meat trade of the seizure of beasts without compensation. Great dissatisfaction existed among the trade in Newcastle, and there the butchers had established a mutual insurance system at the rate of 2/6 a head. If local authorities had to compensate for carcases destroyed they would be more disposed to adopt the recommendation of the Royal Commission and destroy only the parts affected. The trade felt that it was unfair that they should have to resort to mutual assurance to protect themselves against the seizures made by local authorities. A meat salesman ought not to be considered criminal for having in his possession unsound meat which he bought as sound when alive. The value of the animal could be estimated, but the loss a man might suffer from a prosecution could not be estimated. As the law stood, a butcher finding traces of disease in a carcase he was dressing would suffer pecuiary loss if he gave notice to the sanitary authority, so that a premium was placed on concealment and dishonesty.

Mr William Cooper, Member of the Corporation of London and Member of the Council of Smithfield Club, gave evidence in his capacity as a salesman of Scottish meat in the Central Market, Smithfield. It was impossible, he said, to discover the existence of tuberculosis in a live animal except in those cases where wasting occurred. A carcase gained a prize at the Smithfield Show last year in which, after slaughter, symptoms of the disease were found, though the animal had been passed by Professor Axe. He was not a great believer in the tuberculin test: there was danger of communicating the disease by the application of the test. The seizures of pork were especially hard upon dealers. He regarded a change in the law which would provide compensation from the Exchequer as a means of getting rid of the disease just as pleuro-pneumonia had been got rid of. It would be wrong to saddle a small district with the cost of compensation for animals condemned at a large business establishment in that district into which animals were collected from all parts of the country. Inasmuch as the eradication of the disease would be for the benefit of the whole community, compensation should be a national charge.

The Committee adjourned.

This Committee of the House of Commons took further evidence in relation to this Bill on Thursday, June 23rd, Mr. Grant Lawson presiding.

Mr. Thomas Webster, wholesale meat salesman in Glasgow Market and president of the United Fleshers' Society, said there were bitter complaints among dealers of losses suffered through the condemnation of carcases because after slaughter traces of tuberculosis were found. To some men the loss had been ruinous. He had not suffered very much in his own business, but he bought chiefly foreign meat, in which there was less risk. When a very low price was given for an animal he would not have compensation paid, because the price would imply there was risk of the meat's proving unsound; the limit below which compensation should be paid might be fairly fixed at £8. It was not possible to establish a system of warranty, because from the time an animal left the farm it passed through many hands before it was slaughtered. It was very difficult to institute a system of mutual insurance. The condemnation of a whole carcase was often wasteful; parts only should be destroyed, and the remainder might be quite fit for food. For the infected parts removed he would not have compensation paid, and the limit of compensation for a carcase he would fix at £30. Compensation should come from Imperial funds.

Mr. W. Ramsden, wholesale butcher and cattle salesman in Liverpool and Manchester, estimated upon an experience of 800,000 cattle slaughtered in a year by the Liverpool Abattoir Company, of which he was chairman, that about 1 per cent. of the cattle were condemned for tuberculosis. The percentage was higher in pigs. He suggested that compensation might come from a fund provided half from Imperial sources and half from the district where the cattle were produced. He would have bulls registered after passing the tuberculin test.

Alderman Redman (Southwark) expressed a decided opinion that State compensation would finally get rid of the disease and that the present state of the law was prejudicial to the English cattle trade.

Mr. R. Brechin, butcher, Glasgow, gave similar evidence.

The committee adjourned.—*The Times.*

American Methods.

SURGEON FARLEY OPERATES ON BACCHANAL TO REMOVE AN ABSCESS.

It is one thing to trephine the skull of a man and quite another thing to remove a section four inches square from the skull of a thoroughbred race horse. The man can be put under chloroform and kept quiet during the operation. Experience has demonstrated that horses and other animals do not recover from the influence of powerful anæsthetics, and owners of thoroughbreds take no chances. That is why horsemen are talking about a successful trephining operation performed recently on Bacchanal, the Rayon d'Or steeplechaser that carries Charles Pfizer's colors. The operation is declared to be a triumph of veterinary surgery. The horse was dying from an abscess over the eye, at the base of tbe brain. In a few days it will be galloping over the turf again.

The peculiar conformation of a horse's skull makes trephining a ticklish operation in veterinary surgery. An effort was made to reach the abscess that bothered Bacchanal by probing through the nostrils, but Surgeon Oliver Farley was afraid of probing too far and touching the brain, which would have been fatal. When the operation was decided upon Bacchanal was taken into a yard adjoining his stable and cast. His feet were firmly secured and two men held his head. It was not possible to administer even a local application of cocaine. The abscess was so close to the eye that the sight might have been endangered.

The delicate instrument used for trephining a man's skull gives no idea of the large saw, manipulated by a handle that works like a corkscrew, used for a horse. It was impossible to make the incision over the eye, for a horse's forehead is as thin as cardboard. Lower down on the nose, where the incision was made, it is one-sixteenth of an inch thick. The operation lasted fifteen minutes, and Bacchanal stood it remarkably well. His gratitude when the abscess was drained and he felt relief from pain that had been almost unendurable for months was apparent.

A few days ago Surgeon Farley performed an operation for tracheotomy on a thoroughbred. He took out a section of one of the cartilaginous rings of the trachea and inserted a silver tube more than one inch in diameter. In two days the horse was out in the paddock again.

"There is a fine high-stepper," said Surgeon Farley, "seen every afternoon in the Park and on Fifth Avenue that has no other method of breathing except through a silver tube. The horse never wheezes, except when it is forced too hard.

"When I was in Canada two years ago I drove past a farm one day, and the owner came running out to me and asked me to look at his mare. The poor beast had catarrh so bad that it was almost choking to death. I got the farmer and his men to cast the horse, while I ran into the kitchen and wrenched the spout from a tin kettle. I made an incision in the throat, turning over the edges of the spout so that it would not slip into the larynx. That mare is alive and working to-day, and of all the improvised artificial windpipes, I have never run across anything to beat the spout of that old tin kettle."

Mr. D. Silvestro Rabagliati, B.Sc., who passed with honours at the recent examination of the students of the Royal (Dick) Veterinary College, has received an appointment as a veterinary inspector under the Egyptian Government. We understand he leaves for Egypt immediately, and is at once to be employed on cattle plague duty.—*The Evening Dispatch* (Edin.)

Army Remount Commissions in France.

Le Bulletin Vétérinaire reprints an article published in the *Lyon Républicain* pointing out how the innovation introduced by General André last year, of including veterinary officers in the purchasing commissions, is being rendered ineffective. There appeared to be a "passive resistance" to the measure, particularly on the part of the cavalry, and M. Sentupery points out that "It would be easy for the opponents of the measure by manipulating paper evidence to pile up on the heads of those not long since appointed all the faults they have committed, and to use this as a *dossier* to discredit the recent reforms. But the argument would be a lame one. Without doubt all veterinarians would not be perfect buyers. This work calls for special capacities and special training. But at any rate veterinarians are by their studies much more apt to become specialists than cavalry officers—even the best.

If it is really intended to carry out this reform, and to make the best use of it the same proceeding should be adopted that is in use for troop officers. They should first be appointed temporarily to allow a judgment of their special aptitude. Instead of this, how is the actual cadre constituted? Usually of officers "tired" or inactive who find in the remount a quasi-repose that suits them; and they are admitted without any sort of enquiry as to their knowledge or fitness for this special service.

And the veterinarians who form part of these purchasing committees, what are they? Good men, no doubt; anyway we are satisfied to think so. But in no case are they selected in view of this purchasing. They are simply the men doing the veterinary work of the depôts. We may well believe that for some time past all holding these posts are capable of buying to advantage; but the general interest would be better served if they were selected by the veterinary inspectors, who know their men and are in a position to judge their aptitude.

Truly it seems strange that so much strife is necessary to obtain such simple reforms; especially difficult to understand in this matter of including veterinarians in the purchasing commissions.

Is it not droll to see that *no officer ever dare buy a horse for himself* without the help of his veterinary comrade—and the same officer *always* finds himself equal to buying, single-handed, any number for the service of the State.

Diseases of Sheep.

At the Guildhall, London, last week, an International Conference was held by the National Sheep-Breeders' Association.

Professor T. W. CAVE, Professor of Veterinary Surgery in the South-Eastern Agricultural College, Wye, Kent, said in the course of an address that in a county like Kent, where the land had been grazed over by sheep for generations, it became saturated with various parasites. Again, disease-producing organisms escaped from the bodies of dead animals, especially when the carcases were flayed and cut up. The countless myriads of microbes which each carcase contained were allowed to contaminate the soil, and consequently such diseases appeared with unfailing regularity at the proper seasons. —*The Daily News.*

Veterinary Surgeon's Charges.

H. R. who has received a bill for £3 5s. 6d. from a veterinary surgeon in a country village for attending his horse for ten days asks whether tho charges are reasonable; the charge for a visit was 1s., and for a drench, 2s., as many as three drenches a day being given.

*** We have made inquiries and are informed that the charge for a drench for a horse varies from 1s. 9d.

wholesale to 2s. 6d. retail; the charge of 1s. a visit is regarded as very cheap, even though the veterinary surgeon lived quite close by. The daily average for the attendance of a veterinary surgeon including the drenches may be taken to be about 7s.; three drenches daily would not be excessive in certain cases. On the whole it may be said that the charges are not excessive.—*B.M.J.*

ARMY VETERINARY DEPARTMENT.

Extract from *London Gazette*,

WAR OFFICE, PALL MALL, June 24.

Capt. A. C. Newsom to be Major.

Lieut. H. C. Welch is seconded under the Colonial Office.

INDIAN CIVIL VETERINARY DEPARTMENT.

Majors to be Lieut.-Colonels:—J. B. Mills and J. W. A. Morgan.

CORRESPONDENCE.

PIROPLASMA BOVIS.

Sir,

My attention having been drawn Prof. Wooldridge's letter in last week's *Veterinary Record* on the above subject, might I be allowed to trespass upon your space in order to briefly reply and question certain of his statements.

First as to the previous communications made regarding the presence of Piroplasma bovis, I should like to point out that the only ones in English containing original statements that this organism had actually been seen are those of Mr. Mason (*V.R.*, No. 686, 1901) and Mr. Thorburn (Idem. No. 742, 1902), the latter of which is referred to in my note of a fortnight ago. The other papers quoted are entirely hypothetical, the writers arguing from analogy with the other forms of piroplasmosis, and can, then, be dismissed from all consideration.

Mr. Mason's note appeared in 1901 and contains the somewhat scanty information that Professor Mettam had seen the parasite in cases of redwater near Dublin. No mention of the appearance, pathogenicity or morphological characters of the parasite were given, nor from that date, now three years ago, has such appeared in English veterinary literature. Does that constitute a proof that the piroplasma is present? Would any man accept without a murmur the fact that this organism had been described when its discovery is announced by a second party in a bare two lines of print? Surely the presence of a parasite of such world-wide importance is worthy of more than this.

Professor Wooldridge states also that the late Mr. Warwick had observed the piroplasma bovis in Cumberland during the year 1902. May I question this statement? Mr. Warwick was present when my paper on this subject was presented before the Edinburgh Veterinary Medical Association in 1903, and there stated that although he had not observed the parasite himself he believed that it must be present in Cumberland; at the time showing the organism in a film made by Nocard from a case of redwater with which he came in contact during his white scour investigations in Ireland. This is the only authentic record of its existence, reference being made to that particular case in Nocard and Leclainche, Maladies Microbiennes des Animaux, vol. ii, p. 539. To quote this sentence, "In Ireland, Nocard demonstrated the piroplasma in the blood of a cow suffering from a severe attack of "Redwater." The writer asserts that for several years it has been customary in at least two of the colleges to teach that redwater of the British Isles is due to Pyrosoma bigeminum.

To whom are we to give credit for studying this important organism in Redwater throughout the British Isles? Why has the veterinary profession been kept in the dark regarding its presence? Why has nothing been published from any one of these Colleges? And for how many years, and in what colleges has it been customary to enunciate this doctrine?

Surely in all veterinary colleges save only the one in Dublin, where the piroplasma had been seen, this teaching was absolutely hypothetical. Even here how can one assume that this organism is the *cause* of redwater. Without experimental observation it is impossible to admit its etiological connection. Where was this research conducted, and in what journals have the results been published? If such have been published they are, to say the least, inaccessible, for in a paper on Canine Piroplasmosis by Nuttall (*Journal of Hygiene*, May, 1904), while speaking of the bovine variety this writer states that it is probable that P. bovis exists here. Few people have doubted this *probability*.

This undoubtedly proves that any literature on the subject in this country is woefully incomplete, and it was that sentence of Nuttall's more than any other thing that induced me to publish a preliminary note. If the piroplasma is present here why should the fact not be made known, and some description, at least, of the parasite given.

Prof. Wooldridge would suggest that I claim priority for its demonstration—I presume he refers to its demonstration in this country—I claim no such. To Nocard belongs the credit for having himself first described it in the United Kingdom, Prof. Mettam having published nothing on the subject; but I must contend that the note published in *The Veterinary Record* of June 18th, is the first intimation, with the exception of the note by Mr. E. J. Thorburn and myself already referred to, that the parasite has been seen in England: and further that no attempt has been previously made to describe the piroplasma bovis as it occurs here.

R. E. MONTGOMERY.

THE STAINING OF THE ORGANISM OF EPIZOOTIC LYMPHANGITIS.

Dear Sir,

With reference to the above I regret to find that Prof. Mettam, to whom I have endeavoured to give the credit which I considered was due to him in connection with the staining of the organism of this disease, should have found it necessary to write and point out that I had omitted to give the particular modification of staining, which he recommends. In case any misapprehension should occur as a result of his remarks on the subject in last week's *Veterinary Record*, I wish to take this opportunity of stating that most reliable and satisfactory results have been obtained by the methods of staining which I have detailed in my monograph, and to draw attention to the fact that I have therein already carefully pointed out the advantages of using aniline oil as a decolourising agent in preference to alcohol, and mentioned that the organism had already been stained by Nocard with carbol fuchsine; in fact it will be found that the cryptococcus can be stained almost equally as well as any one of the aniline dyes, provided the solutions are carbolised and that the process of decolourising is carefully carried out. The advantage of using a strong iodine solution as recommended for the Gram-Nicolle method of staining is also pointed out, so that with the exception of heating, the results to be obtained from the information which I have given are practically the same as those which may be obtained by adopting the method which Prof. Mettam particularly recommends.

W. A. PALLIN.

COMMUNICATIONS, BOOKS AND PAPERS RECEIVED.—Messrs. Wakefield Rainey, A. Green, F. E. Place, R. Lewis Green, G. H. Locke, R. E. Montgomery. Capt. W. A. Pallin, Lt. A. S. Head.